

Claims

1. Method for the production of a semi-finished product (13) for a wing-shaped element (15) having, in cross-section, a front edge (2), a rear edge (14) and an arched bottom wall (3) and an arched top wall (4) that extend some distance apart between the front edge (2) and the rear edge (14), comprising the following steps:
  - providing a metal sheet (1),
  - bending the sheet (1) with the formation of two panels (3, 4) as well as a curved region (2) which the panels (3, 4) adjoin,
  - 10 - providing a former (10), the exterior of which has the shape of the internal surface of the finished element (15),
    - placing the former (10) in the bent sheet (1) with the front edge of the former (9) positioned in the curved region (2),
    - providing an edge press (5) provided with a pressure member (8) and a rubber cushion (7) located opposite,
      - fixing the former (10) to the pressure member (8),
      - forcing the pressure member (8) towards the rubber cushion (7) with the bent sheet (1) enclosed between them and deforming said sheet between the former (10) and the rubber cushion (7),
    - 20 - removing the former (10) with shaped sheet (1') from the edge press (5),
      - placing the shaped sheet (1') in a rubber press provided with a bottom block having a cavity (16) which has a shape that at least approximately corresponds to the external shape of one of the walls (3, 4) of the shaped sheet (1'),
        - pressing the shaped sheet (1') with former (10) between the bottom block (11) and a rubber mat (12),
        - removing the semi-finished product (13) from the rubber press.
  - 25 30 3. Method according to one of the preceding claims, comprising bending the curved region (2) and optionally arching the panels (3, 4) by means of roller forming.

4. Method according to one of the preceding claims, comprising bending the curved region (2) and optionally arching the panels (3, 4) by means of rolling.

5. Method according to one of the preceding claims, comprising constructing the rear edge using a section (14) that is fixed to the top wall (3) and the bottom wall (4) with the formation of a wing-shaped element (15).

6. Method according to one of the preceding claims, including a heat treatment step, such as stress-free annealing or solution annealing of the semi-finished product (13).

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7. Wing-shaped element (15) produced in accordance with the method according to one of the preceding claims, made as a vane.

15 8. Element (15) according to Claim 7 as produced by means of the method according to Claim 5, wherein the section (14) has a body (19) that extends between the panels (3, 4).

9. Element (15) according to Claim 8, wherein the panels (3, 4) and the body (19) are fixed to one another by rivets (18), bonding and the like.

20 10. Element (15) according to Claim 8 or 9, wherein the surfaces (16, 17) of the body (19) facing away from one another run obliquely with respect to one another in accordance with the run of the panels (3, 4).

25 11. Element (15) according to Claim 7, wherein the panels (3, 4) are fixed directly to one another.

12. Element (15) according to one of Claims 7 - 12, comprising a sheet (1) with a thickness in the range of 0.8 - 2.0 mm.

30 13. Element (15) according to one of Claims 12, comprising a sheet (1) with a thickness in the range of 1.4 - 1.6 mm.

14. Element (15) according to one of Claims 12 or 13, comprising a sheet (1) with a thickness in the region of 1.6 mm.

15. Element (15) according to one of Claims 7 - 12, comprising a sheet material  
5 consisting of Al, Ti, Sc, Cu, Mg, Li and/or alloys thereof and/or steel and/or stainless steel.